

## Bachelor of Vocation in Pottery & Ceramic Course curriculum

### Semester-I

Paper No.	Subject	Credit	Contact Hrs/Sem	Max. marks for each paper				Total marks	Nature
				Theory		Practical			
				Internal	Annual	Internal	Annual		
BVoc-I/01	Communication skill in English	2	32	10	40	-	-	50	Theory
BVoc-I/02	History of ceramics	2	32	10	40	-	-	50	Theory
BVoc-I/03	Ceramic raw materials	4	64	20	80	-	-	100	Theory
BVoc-I/04	Applied science-I	4	64	20	80	-	-	100	Theory
BVoc-I/05	Workshop Practice-I	10	160	-	-	150	150	300	Practical
BVoc-I/06	Surface Decoration	8	128	-	-	100	100	200	Practical
Total		30	480	60	240	250	250	800	

### Semester-II

Paper No.	Subject	Credit	Contact Hrs/Sem	Max. marks for each paper				Total marks	Nature
				Theory		Practical			
				Internal	Annual	Internal	Annual		
BVoc-II/01	Communication skill in Hindi	2	32	10	40	-	-	50	Theory
BVoc-II/02	Ceramic technology-I	4	64	20	80	-	-	100	Theory
BVoc-II/03	Applied Science-II	4	64	20	80	-	-	100	Theory
BVoc-II/04	Computer Basic	4	64	-	-	20	80	100	Practical
BVoc-II/05	Screen printing technique	6	96	-	-	75	75	150	Practical
BVoc-II/06	Industrial Exposure-I	10	Two months	-	-	150	150	300	Practical
Total		30	320	50	200	245	305	800	

### Semester-III

Paper No.	Subject	Credit	Contact Hrs/Sem	Max. marks for each paper				Total marks	Nature
				Theory		Practical			
				Internal	Annual	Internal	Annual		
BVoc-III/01	Environmental studies	2	32	10	40	-	-	50	Theory
BVoc-III/02	Ceramic machineries	4	64	20	80	-	-	100	Theory
BVoc-III/03	Ceramic technology-II	4	64	20	80	-	-	100	Theory
BVoc-III/04	Technical drawing	4	64	-	-	20	80	100	Practical
BVoc-III/05	Workshop Practice-II	10	160	-	-	150	150	300	Practical
BVoc-III/06	Ceramic testing-I	6	96	-	-	75	75	150	Practical
Total		30	480	50	200	245	305	800	

## Semester-IV

Paper No.	Subject	Credit	Contact Hrs/Sem	Max. marks for each paper				Total marks	Nature
				Theory		Practical			
				Internal	Annual	Internal	Annual		
BVoc-IV/01	Industrial Economics	2	32	10	40	-	-	50	Theory
BVoc-IV/02	Computer Aided Design (CAD)	4	64	-	-	20	80	100	Practical
BVoc-IV/03	Ceramic technology-III	4	64	20	80	-	-	100	Theory
BVoc-IV/04	Ceramic Testing-II	4	64	-	-	20	80	100	Practical
BVoc-IV/05	Workshop Practice-III	6	96	-	-	75	75	150	Practical
BVoc-IV/06	Industrial Exposure-II	10	Two months	-	-	150	150	300	Practical
Total		30	320	30	120	265	385	800	

## Semester-V

Paper No.	Subject	Credit	Contact Hrs/Sem	Max. marks for each paper				Total marks	Nature
				Theory		Practical			
				Internal	Annual	Internal	Annual		
BVoc-V/01	Industrial Management and Entrepreneurship	2	32	10	40	-	-	50	Theory
BVoc-V/02	Quality Management	4	64	20	80	-	-	100	Theory
BVoc-V/03	Fuel & Furnace	4	64	20	80	-	-	100	Theory
BVoc-V/04	Ceramic technology-IV	4	64	20	80	-	-	100	Theory
BVoc-V/05	Ceramic Design	6	96	-	-	75	75	150	Practical
BVoc-V/06	Workshop Practice-IV	10	160	-	-	150	150	300	Practical
Total		30	480	70	280	225	225	800	

## Semester-VI

Paper No.	Subject	Credit	Contact Hrs/Sem	Max. marks for each paper				Total marks	Nature
				Theory		Practical			
				Internal	Annual	Internal	Annual		
BVoc-VI/01	Project Work	16	320	-	-	200	200	400	Practical
BVoc-VI/02	Comprehensive Viva-Voce	4	-	-	-	-	100	100	Practical
BVoc-VI/03	Industrial Exposure-III	10	Two months	-	-	150	150	300	Practical
Total		30	320	-	-	350	450	800	

# Bachelor of Vocation in Pottery & Ceramic Syllabus

## Semester-I

Communication skill in English

Paper No. BVoc-I/01

- ◆ Listening Comprehension
- ◆ Reading Comprehension
- ◆ Spoken English
- ◆ Communication
- ◆ Vocabulary
- ◆ Grammar; etc.

History of ceramics

Paper No. BVoc-I/02

- ◆ Introduction to the historical development and practice of pottery ceramic wares in various civilization leading to studio pottery and industrial pottery ceramic products.
- ◆ Study of pottery from various places, their style specialty and critical awareness (Indian, Asian, European, etc.).
- ◆ Emphasis on relationship between cultural, Traditional and industrial products.

Ceramic raw materials

Paper No. BVoc-I/03

### □ Plastic Raw materials:

- ◆ *Clay type:* Primary, Secondary, Group kaolin, Montmorillonite, Illite, Vermiculite.
- ◆ *Classification:* China clay, Ball clay, Fire clay, Building clay, Bentonite, Impurity in clay and role thereof.
- ◆ Structural features of clay minerals
- ◆ Occurrence, Availability, Physical and Chemical properties.
- ◆ Beneficiation.

### □ Non-plastic Raw materials:

- ◆ *Silica:* Source – Quartz, Sand, Sandstone, Quartzite, Flint and polymorphic transformation of quartz.
- ◆ *Sillimanite Group:* Sillimanite, Kyanite, Andalusite, and Conversion to Mullite.
- ◆ *Carbonates:* Limestone, Calcite, Magnesite, and Dolomite.
- ◆ *Fluxes:* Feldspar – Orthoclase – Plagioclase series, Felspathoids – Nepheline, Sodalite, Leucite.
- ◆ *Miscellaneous:* Bauxite, Diaspore, Pyrophyllite, Olivine, Chromite, Talc, Wollastonite, Zircon, Rutile, Fluospar, Graphite, Mica, Baryte, Gypsum and Plaster of Paris.
- ◆ Effect of heat on clay and other ceramic materials.

Applied Science-I

Paper No. BVoc-I/04

- Physics
  - ◆ Units and dimensions
  - ◆ Newtons laws of motion and friction
  - ◆ Kinematics
  - ◆ Heat
  - ◆ Optics, etc.
- Chemistry
  - ◆ Periodic table
  - ◆ Chemical Bonding

- ◆ Structure and properties of solid materials
- ◆ Corrosion and Phase diagram of basic ceramic materials
- ◆ Air & water pollution
- ◆ Disposal of industrial waste

Workshop Practice-I  
Paper No. BVoc-I/05

- ◆ Simple exercise in surface texture, Pattern and design: Exercises in various 2-D & 3-D Visualization techniques, Concept drawing, Designing of concept and colour rendering of pottery ceramic products.
- ◆ Making of Plaster of Paris Mould
- ◆ Preparation of simple pottery by Throwing & Turning, Slip casting, etc.

Surface Decoration  
Paper No. BVoc-I/06

- ◆ Freehand drawing – nature & object.
- ◆ Analytical drawing of manmade and natural objects, Depicting concepts through conscious analysis using strip form, Plain form and 3-D form.
- ◆ Concept formation.
- ◆ Decoration treatment on raw clay, Beating, Identity, Embossing, Modelling, etc.

## Semester-II

Communication skill in Hindi

Paper No. BVoc-II/01

- ◆ Hindi as link language, national language, official language, Hindi in administration law and business, Hindi and mass communication.
- ◆ Correspondence in, Technical terminology.
- ◆ Communicative skills in different spheres of life, interviews
- ◆ Conversation as a communication technique.

Ceramic Technology-I

Paper No. BVoc-II/02

- Introduction
  - ◆ History, definition, whiteware, heavy clayware, classification, rawmaterials, batch calculation, mixing, forming, drying, firing, glazing, decoration.
- Body formulations
  - ◆ Body composition – earthenware, Stoneware, bone china, hotel china, terracotta, majolica, etc.
- Whiteware products
  - ◆ Manufacturing process & properties, whitewares at home – tableware, kitchenware, flame resistant ware, art ware, containers.
- Properties & testing
  - ◆ Strength – tensile, flexural, Impact – absorption & porosity – moisture expansion – thermal expansion – thermal shock resistance – chemical durability

Applied Science-II

Paper No. BVoc-II/03

- Algebra
  - ◆ Determinants
  - ◆ Matrices
- Trigonometry
  - ◆ Properties of trigonometric functions
  - ◆ Trigonometric equations
  - ◆ Properties and solutions of triangle
  - ◆ Inverse trigonometric functions
- Analytical geometry
  - ◆ Elements of conics
- Calculus
  - ◆ Functions and limits
  - ◆ Methods of differentiation-I
  - ◆ Methods of differentiations-II
  - ◆ Application of differentiation
  - ◆ Integration
  - ◆ Definite integrals and applications
  - ◆ Differential equations

Computer Basic

Paper No. BVoc-II/04

- ◆ History and generation classification of computers, Theory of computers, about RAM ROM, Mother board etc.
- ◆ Binary and allied number system representation of sign & unsigned number. BCD, ASCH. Binary arithmetic.

- ◆ Software concepts and terminology, Operating Systems concept. File attribute Fundamentals of data communication, Computer network concepts and emerging trends, Management of computer security, Virus, Firewalls
- ◆ Introduction to GUI, Manage system in Windows XP, File & Folders, Program and accessories, Multimedia in Windows XP
- ◆ Application basics and various Office automation suites like MS Word, MS Excel, MS Power Point
- ◆ Internet overview: Email, DNS, FTP, Client/ Server, Browser, Search Engines, Visiting useful websites.

#### Screen printing technique

Paper No. BVoc-II/05

- ◆ Screen preparation techniques
- ◆ Preparation of colour paste
- ◆ Printing on flat and round surface

#### Industrial Exposure-I

Paper No. BVoc-II/06

- ◆ All the students have to undergo practical industrial training of eight week duration in recognized establishments. At the end of which they have to submit a report. The internal assessment will be based on the report and presentation and the examination marks be based on viva voce examination.

### Semester-III

#### Environmental studies

Paper No. BVoc-III/01

- ◆ Classification of environmental pollution
- ◆ Composition and structure of atmosphere
- ◆ Major air and water pollutants, Effects of air and water pollution on human beings, animals and plants
- ◆ Control of pollution
- ◆ Green house effect, Ozone layer and its role, Acid rain
- ◆ Waste water treatment, treatment and disposal of solid wastes and their effective utilization, Carbon cycle
- ◆ ISO Standard in relation to environment
- ◆ Visual pollution and appropriate environmental design
- ◆ Carbon credit, carbon footprint and Kyoto protocol
- ◆ Energy management.

#### Ceramic Machineries

Paper No. BVoc-III/02

- ◆ Power driven potter's wheel and its constructional details, Jaw crusher, Roller mill, Edge runner, Pot mill, Ball mill, Blunger, Filter press, De-airing pug mill, Diaphragm pump, Agitator, Jigger Jolly, Slip house equipments, etc.
- ◆ Different types of dryers: Chamber dryer, Vertical dryer, Spray dryer, etc.

#### Ceramic Technology-II

Paper No. BVoc-III/03

- ◆ Ceramic raw materials for tiles: China clay, Ball clay, Red clay, Quartz, Flint, Silica Sand, Feldspar, Nepheline syanite, Talc, Wollastonite, allied materials and their functions. etc.
- ◆ Manufacturing processes of tiles: Slip house, Powder preparation and shaping, Drying, Glazing and decoration, Firing, Sorting norms, Quality control in various stages of operation, Visual inspection and identification defects, etc.
- ◆ Unit operation related to ceramic practice: Mass transfer, Heat transfer, etc.

#### Technical drawing

Paper No. BVoc-III/04

- ◆ Importance of technical drawing
- ◆ Technical drawing instruments
- ◆ Free hand lettering & numbering
- ◆ Dimensioning practice
- ◆ Geometrical Construction
- ◆ Orthographic projection
- ◆ Sectional view
- ◆ Auxiliary view
- ◆ Pictorial drawing
- ◆ Development of surfaces
- ◆ Equipment design, Plant design and calculations.

Workshop Practice-III  
Paper No. BVoc-III/05

- ◆ Fabrication of different tile body: Raw material collection, Milling, Powder preparation, Pressing, Glazing, Decoration, Firing, Polishing, sorting, packaging, Testing of tiles, etc.

Ceramic testing-I  
Paper No. BVoc-III/06

- ◆ Chemical Analysis of Important Raw Materials: Different compositional oxides present in the following raw materials – Different type of clays, Quartz, Feldspar, Talc, Pyrophyllite, Wollastonite, Dolomite, Calcite, etc. by gravimetric, volumetric and complexometric methods.



## Semester-IV

### Industrial Economics

Paper No. BVoc-IV/01

- ❑ Principles of production management and organization
  - ◆ Planning, organization, staffing, coordination, directing, controlling, communicating, organization as a process and a structure, types of organizations, Method study, work measurement techniques, basic procedure, motion study, motion economy, principles of time study, elements of production control, forecasting, planning, routing, scheduling, dispatching, costs and costs control, inventory and inventory control.
- ❑ Engineering economics for process engineers – Interest, Investment cost and Cost estimation
  - ◆ Time Value of money, capital costs and depreciation, estimation of capital cost, manufacturing costs and working capital, invested capital and profitability.
- ❑ Profit ability, Investment alternative and replacement
  - ◆ Estimation of project profitability, sensitivity analysis; investment alternatives; replacement policy forecasting sales; inflation and its impact.
- ❑ Annual reports and analysis of performance
  - ◆ Principles of accounting; balance sheet; income statement; financial ratios; analysis of performance and growth.
- ❑ Economic balance and quality and quality control
  - ◆ Essentials of economic balance – Economic balance approach, economic balance for insulation, evaporation, heat transfer.
  - ◆ Elements of quality control, role of control charts in production and quality control.

### Computer Aided Design (CAD)

Paper No. BVoc-IV/02

- ❑ Introduction to CAD, Benefits of CAD, Stages of CAD, CAD input output devices, CAD display devices, Types of CAD systems, Types of CAD soft ware, Features of different CAD software, Computer communications, Types of computer communications networks

### Ceramic Technology-III

Paper No. BVoc-IV/03

- ❑ Introduction to glaze
  - Definitions, composition of glaze, classification of different types of glazes, engobe, frit preparation, fritting rules, compounding of lead and leadless glazes, alkaline glazes, calcareous glazes and feldspatic glazes.
- ❑ Raw materials and Processing
  - Glaze raw materials, effect of individual materials, opacifiers, colouring agents, stains, mixed colours, metallic lustures, unit operations and processes, glaze properties, grain size, specific gravity, viscosity glaze control, additives, glaze suitability, fired properties of glazes.
- ❑ Glazing techniques and special glazes
  - Glazing techniques, dipping, pouring, spraying, brushing, dusting and other techniques
  - Special glazes: matt glazes, snake skin glazes, crackled glazes, salt glazes and other glazes.
- ❑ Properties and defects
  - Glaze body reactions, interface layers, thermal characteristics, mechanical, optical and chemical properties of glazes, glaze defects and remedies, crazing, peeling, crawling, rolling, blisters, pin holes, dunting.
- ❑ Colours
  - Definition of ceramic colours, Various type of ceramic colours – Under glaze colour, In glaze colour, Over glaze colour, Enamel colour; Preparation of stain – body stain, glaze stain; Cobalt colours, Copper colours, Iron colours, Preparation of red oxide, Manganese colours, Uranium colours, Chromium colours, Coral reds, Chrome pinks, Influence of raw materials on the pink colour, Antimony

colour, Cadmium colour, Gold colour, Ruby red, Platinum colour, Mixed colours, Metallic lusture, Mixed lustures, Liquid Gold, Preparation of gold glance, Preparation of stain fluxes and use, Defects.

❑ Decoration

Classification of decoration methods, advantages, different decorating techniques, painting, spraying, stenciling, stamping, printing, lithographic transferring, silk screen printing, dusting, engobing, liquid gold decoration and decoration techniques.

### Ceramic Testing-II

Paper No. BVoc-IV/04

❑ Testing for raw materials

- ◆ Sampling methods – coning and quatering
- ◆ Measurement of moisture content by IR moisture balance, speedy moisture test
- ◆ Particle size analysis – sieve test, sedimentation method
- ◆ Determination of surface area by permeametry, adsorption.
- ◆ Determination of Specific gravity, Viscosity

❑ Testing of physical properties

- ◆ Plasticity – Pfefferkorn test, Atterberg test, Casting
- ◆ Control of casting slips- fluidity, thixotropy, specific gravity,
- ◆ Shrinkage – wet to dry, dry to fired, wet to fired,
- ◆ Modulus of rupture, vitrification, density, porosity, water absorption.

❑ Testing for glaze

- ◆ Measuring coherence parameter – pick up
- ◆ Testing of viscosity of glazes at low temperatures and high temperatures
- ◆ Test for the solubility of lead frits
- ◆ Glaze fit, hardness testing, glaze thickness, autoclave and crazing, thermal shock measurement.

### Workshop Practice-IV

Paper No. BVoc-IV/05

- ◆ Preparation of Glaze Slip, Fusion Studies, Particle Size and Particle Size Distribution of Glaze, Determination of Viscosity of Glaze Slip, Determination of Flow Properties of Glaze Slip, Preparation of Coloured Glazes, Application of Glazes, Glost Firing, Decoration, Measurement of Thickness of Glaze, Determination of Scratch Resistance, Crazing Analysis, Determination of Acid Resistance by boiling acid, Determination of Alkali Resistance by boiling alkali, Determination of Thermal Expansion of Glaze using Dilatometer. Skid resistance

### Industrial Exposure-II

Paper No. BVoc-IV/06

- ◆ All the students have to undergo practical industrial training of eight week duration in recognized establishments. At the end of which they have to submit a report. The internal assessment will be based on the report and presentation and the examination marks be based on viva voce examination.

## Semester-V

### Industrial Management and Entrepreneurship

Paper No. BVoc-V/01

- Principles and functions of management
  - ◆ Role of Industry, types of ownership – sole proprietorship, partnership, private limited, public limited company, industrial co-operatives, functions of management.
- Role of entrepreneur
  - ◆ Role of small industry – self employment schemes, characteristics of entrepreneur.
- Entrepreneurial Development
  - ◆ Product selection, site selection, plant layout, profile and requirement, need for a planned and coordinator effort, follow up, industrial support needed, financial assistance programmes, premarket survey.
- Organisation behavior
  - ◆ Job analysis, selection, achievement motivation, satisfaction, performance, reward system, quality of work life, leadership in organization, decision making, communication, group management.
- Production management
  - ◆ Production planning and control, relation with other departments, need for planning and advantages, routing, scheduling dispatching.
- Materials management
  - ◆ Materials in industry, inventory control model, ABC analysis, safety stocks, reorder level, economic ordering quantity, stores layout, stores equipment, stores record, purchasing procedures, purchase records, Bin Card, Cardex, materials handling, manual lifting, hoist, cranes, conveyors, trucks, fork tucks.
- Financial management
  - ◆ Importance, ledger, journal, profit and loss accounts, balance sheet, interpretation of statements, project appraisal, product costing.
- Marketing and sales
  - ◆ Marketing, sales, market conditions, monopoly, oligarchy, perfect competition, cost, elements of cost, contribution, Break even analysis, budgets, pricing policies.
  - ◆ Various licenses required for selling up an industry and the licensing authority.
  - ◆ Shop floor - handling & practices, shop floor management (personnel management) understanding appraisal norms & practices.
  - ◆ Facing the interviews.
- Feasibility study
  - ◆ Market survey, product and production analysis, materials input, manpower, location economic and technical evaluation of feasibility study reports – different products.
- Industrial safety
  - ◆ Importance of safety in work places, factories and provisions, safety education, hazards, causes, accidents, electrical hazards, fire extinguishers, Indian electricity rules.
- Industrial legislation
  - ◆ Trade union, collective bargaining, welfare activities, rights and responsibilities of employers and employees. Salient features of (i) Indian Factories Act, (ii) Minimum wages Act, (iii) Industrial Disputes Act, (iv) Workmen's Compensation Act, (v) ESI Act

### Quality Management

Paper No. BVoc-V/02

- ◆ Concepts of standardization:  
Historical development of standards, aims, techniques, management, formulation, implementation of company standards, economic benefits of standardization.
- ◆ Indian standards for ceramic materials:  
IS Specification, Specification for different raw materials, test procedures, products-tiles, sanitary ware, insulators, chemical resistant wares, structural ceramic materials, refractories.

- ◆ Concepts of quality:  
Quality engineering, planning for quality and reliability, quality standards, specification of inspection methods, setting of standard quality levels, introduction to ISO 9000, design of quality experiments using statistics, analysis of variance.
- ◆ Statistical quality control:  
Introduction to taguchi methods and 6 sigma concepts, objectives of statistical quality control, inspection and its importance, difference between inspection and quality control, basic statistical methods- techniques of quality control, control charts for attributed, control charts for variables.
- ◆ Decoration:  
Definition of reliability, factors affecting reliability, MTTF, MTBF, evaluation of reliability, quality management, organizing for quality, economy of quality, techniques of ABC analysis, quality management education, zero defects concept.

#### Fuels & Furnaces

Paper No. BVoc-V/03

- Fuels
  - ◆ Definition.
  - ◆ Solid fuels – wood, coal, agro based fuels and its qualities.
  - ◆ Liquid fuels – liquid petroleum products, synthetic liquid fuels, bio fuels.
  - ◆ Gaseous fuels – LPG, producer gas, water gas, other gaseous fuels
  - ◆ Characterization of coal, coal washing, blending, carbonization of coal, manufacture of coke and recovery by products, pulverized coal.
- Burners and combustion
  - ◆ Burner - classification, atomization, low pressure burner for gaseous fuel, high pressure burner for liquid fuels, advantage & disadvantage of different burners.
  - ◆ Combustion - Air requirement, combustion processes of solid, liquid, gaseous fuels, control of combustion process, combustion stoichiometry.
  - ◆ Flames – nature of flames, laminar & turbulent, premixed & diffusion, burning velocity.
- Furnaces
 

Introduction, definition, various parts of furnaces, Basic knowledge of refractories generally used for ceramic kilns and furnaces, classification and description of different types of furnaces, metal heating furnaces, reheating furnace, continuous furnace, sintering furnace, crucible furnaces, electric furnace, unit melters and smelters, muffle furnace, glass tank furnace, chamber furnace, blast furnace, coke oven batteries. Renewable energy, prevention of energy losses in furnace, waste heat recovery and various areas of uses, Co-gen system.
- Kilns
 

Introduction, definition, classification – draught kiln, chamber kiln, tunnel kiln, roller kiln, rotary kiln, continuous kiln, shuttle kiln, top hat kiln, muffle kiln, Hoffman’s kiln – principle, materials used in foundation and construction, working.
- Pyrometry
 

Introduction and thermometry, thermocouples, optical & radiation pyrometers, low temperature measurement, temperature control, heat work recorders – Segar cone, Holdcroft’s bar, Bullerrings, Watkin recorders

#### Ceramic technology-IV

Paper No. BVoc-V/04

- ◆ Scope of sanitarywares and porcelains in India & there classification and uses.□□
- ◆ Details of various types of raw materials including synthetic materials.□□
- ◆ Body preparation including all the unit operations and fabrication processes - Transport, Storage, Batching, Body compositions, Crushing, Grinding, Screening, Magnetic separation, Agitators, Aging, Slip treatment, Filter pressing, De-airing pug milling, Slip casting, Throwing & turning. □□
- ◆ Drying – Types of water present, Factors affecting drying (internal & external factors), Convection, Radiation, High frequency heating, Type of dryers.

- ◆ Glazing – Purpose & advantages of glazing, Raw glazes, Fritted glazes, Special glazes, Fusibility of glazes, Opacity & opacifiers, Stains, Colloidal colours, Different colouring oxides, Empirical formula of glazes, Glaze defects, Glazing techniques, Testing of glazes. □ □
- ◆ Firing – Factors determining firing schedule, Effect of heat on whiteware bodies, Formation of different phases at different temperatures, Final phases of porcelain bodies, Analysis of microstructure. Brief description about various types of kiln, Kiln furniture & Loading.
- ◆ Properties & testing  
Strength – tensile, flexural, Impact – absorption & porosity – moisture expansion – thermal expansion – thermal shock resistance – heat conductivity – abrasion resistance – chipping resistance – chemical durability – electrical properties – dielectric strength, dielectric constant, power & loss factor, volume resistivity

#### Ceramic Design

Paper No. BVoc-V/05

- ◆ Design for manufacturing and product development-Design definition and design spectrum , Estimation of Manufacturing cost, Reducing the component costs and assembly costs, Minimize system complexity, Prototype basics, Principles of prototyping, Planning for prototypes, Economic Analysis, Understanding and representing tasks, Baseline project planning, Accelerating the project, Project execution, Aesthetic values and user's comfort side

#### Workshop Practice-V

Paper No. BVoc-V/06

- ◆ Fabrication of sanitaryware body: Mould making, Raw material collection, Milling, Slip characterization, Slip casting, Glazing, Drying, Firing, Testing of sanitaryware, etc.
- ◆ Fabrication of different types of porcelain body: Mould making, Raw material collection, Milling, Filter pressing, De-airing pug milling, Throwing & turning, Glazing, Drying, Firing, Testing of properties, etc.

## Semester - VI

### Project Work

Paper No. BVoc-VI/01

- ◆ The objective of the project is to make use of the knowledge gained by the student at various stages of the degree course. Each student will choose problem related to research or industrial problem that has been difficult for them to “solve”.
- ◆ Each student is required to submit a report on the project assigned to him/her by the department for evaluation. The report should be based on the literature collected from the many sources and the actual analysis done by the student on the given project.
- ◆ The internal assessment will be based on the report and presentation and the examination marks be based on viva voce examination.

### Comprehensive Viva-Voce

Paper No. BVoc-VI/02

### Industrial Exposure-III

Paper No. BVoc-VI/03

- ◆ All the students have to undergo practical industrial training of eight week duration in recognized establishments. At the end of which they have to submit a report. The internal assessment will be based on the report and presentation and the examination marks be based on viva voce examination.